

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)



Rec'd PCT/PTO 18 JAN 2005

Applicant's or agent's file reference TS 1286 PCT		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)
International application No. PCT/EP 03/07785	International filing date (day/month/year) 17.07.2003	Priority date (day/month/year) 18.07.2002
International Patent Classification (IPC) or both national classification and IPC C10G73/44		
Applicant SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B.V.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 17.02.2004	Date of completion of this report 08.10.2004
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Harf, J Telephone No. +49 89 2399-7845 

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EXAMINATION REPORT**

International application No. PCT/EP 03/07785

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1, 3-11 as originally filed
2 received on 22.06.2004 with letter of 21.06.2004

Claims, Numbers

1-5 received on 22.06.2004 with letter of 21.06.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

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**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-5
	No: Claims	
Inventive step (IS)	Yes: Claims	1-5
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-5
	No: Claims	

2. Citations and explanations

see separate sheet

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Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document:

D1: WO-A-0174969

The document **D1** (claim 1), which is regarded as being the closest prior art to the subject-matter of independent claim 1, discloses a process to obtain a hydrocarbon wax with a high congealing point by mild hydroisomerisation of a Fischer-Tropsch wax and subsequent vacuum fractionation of this wax. The Fischer-Tropsch wax feed of D1 is characterized by the boiling point data of Table 1. This wax appears to be lighter than the heavy Fischer-Tropsch product of the present invention, as the weight ratio C60+/C30+, estimated by comparison of the boiling point of pure n-alkanes with the boiling curve of the raw Fischer-Tropsch wax, appears to be less than 0.4. The conversion of the hydroisomerisation step of D1 is limited to less than 10 wt-% in order to maximise the yield of isomerised wax with desired hardness.

The present invention differs from this process of D1 in that the **weight ratio C60+/C30+ in the Fischer-Tropsch wax feed is at least 0.4** and in that the **conversion of the hydrocracking/hydroisomerisation step is between 25 and 70 wt-%**.

The subject-matter of independent claim 1 is therefore new in the sense of Article 33(2) PCT.

The problem to be solved by the present invention may thus be regarded as to provide a hydrocracking/hydroisomerisation process for simultaneously preparing both soft waxes having a high congealing point and middle distillate fuels with good cold flow properties.

The solution to this problem proposed in **claim 1** of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

Document D1 teaches away from performing the hydrocracking/hydroisomerisation step at higher conversion levels. This document (page 7, 2nd paragraph) teaches that increased conversion of heavier feed hydrocarbons results in higher yields of gases and other distillates and lower yields of the desired isomerised wax. D1 does further not describe the properties of the obtained other distillates.

None of the available prior art either describes the heavier Fischer-Tropsch wax feed or suggests a high conversion in the hydrocracking/hydroisomerisation stage to both prepare soft waxes and middle distillates having good cold flow properties. Thus, there is no

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indication in this available prior art that would lead the skilled person to modify the process of D1 and achieve the subject-matter of claim 1.

Starting from the hydroisomerisation process of D1, the skilled person would have to exercise inventive skills when selecting a heavier Fischer-Tropsch wax feed and more severe hydrocracking/hydroisomerisation conditions in order to simultaneously obtain soft waxes having a high congealing point and middle distillate fuels with good cold flow properties.

Claims 2-5 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.